FIELD CROP ABSTRACTS

COMPILED FROM WORLD LITERATURE

VOLUME 22, 1969

INCLUDING

ANNUAL INDEXES

Prepared by

COMMONWEALTH BUREAU OF PASTURES AND FIELD CROPS,
HURLEY, MAIDENHEAD, BERKS

Published quarterly by

Commonwealth Agricultural Bureaux, Farnham Royal, Bucks, England

FIELD CROP ABSTRACTS

COMPILED FROM WORLD LITERATURE

VOLUME 22, 1969

INCLUDING

ANNUAL INDEXES

R&D
CAB

Prepared by
COMMONWEALTH BUREAU OF PASTURES AND FIELD CROPS,
HURLEY, MAIDENHEAD, BERKS.

Published during 1969 by
Commonwealth Agricultural Bureaux, Farnham Royal, Bucks, England

The Commonwealth Bureau of Pastures and Field Crops

HURLEY, MAIDENHEAD, BERKS

The Commonwealth Bureau of Pastures and Field Crops is located at the Grassland Research Institute, Hurley, and is one of a group of 11 Bureaux and 3 Institutes which together form the Commonwealth Agricultural Bureaux, an organization financed and administered jointly by the various Commonwealth Governments and Dependent Territories and which provides an information service covering all the major branches of agricultural science.

The Bureau prepares two quarterly journals, *Field Crop Abstracts* and *Herbage Abstracts*, for publication by the Commonwealth Agricultural Bureaux, Farnham Royal, Bucks. These journals contain abstracts of the research findings reported in the world scientific literature on annual field crops, pastures, herbage plants and rangelands and provide both a comprehensive guide to current scientific and technological developments in their subjects and a key to the literature published in the past. In addition to abstracts, the Bureau also issues reviews and monographs on selected subjects.

Scope of Field Crop Abstracts. The subjects covered include the agronomy and botany of all annual field crops grown for food, fodder, oil and fibre, and of tobacco and green manures. Land use, farming systems, agricultural meteorology and the control of weeds, pests and diseases are dealt with only in so far as they concern the crop coverage.

Services offered. The Bureau undertakes to provide bibliographies on subjects within its scope.

Director
C. L. Skidmore, B.Sc. (Agric.) (Lond.), Dip. Agric. (Wye), A.I.C.T.A.

Assistant Director
P. J. Boyle, M.A. (Agric.) (Cantab.)

Scientific Information Officers
Mrs. E. Biasutti Owen (Dr., Milan)
A. V. Bogdan, Cand. Biol. Sci. (Rostov), F.L.S.
R. Boyce, B.Sc. (Dunelm), M.I.Inf.Sc.
M. R. Hails, B.Sc. (Agric.) (Nottm), Dip. Agric. Econ. (Reading)
M. S. Mahal, B.Sc. Agric. (Punjab), Ph.D. (Moscow)
Miss F. A. Stitson, B.Sc. (Exon)
A. C. Trueblood, B.A. (Cantab.), A.I.C.T.A.

Indexers
N. J. Pryor, B.Sc. (Agric.) (Wales)
C. G. Waldock, O.B.E., B.A. (Cantab.)

Consultant Director
E. K. Woodford, O.B.E., M.Sc. (Alberta), Ph.D. (Lond.),
Director, Grassland Research Institute, Hurley, Berkshire.

Other abstractors contributing to this issue :
T. I. Emecz, B.Sc.
A. G. G. Hill, B.A., Agr.B., B.Sc.

The Executive Council of the Commonwealth Agricultural Bureaux is a signatory to the Fair Copying Declaration, details of which can be obtained from The Royal Society, 6 Carlton House Terrace, London, S.W.1.

The Commonwealth Agricultural Bureaux Organization does not accept responsibility for any trade advertisement included in this publication.

© Commonwealth Agricultural Bureaux, 1969

NOTES TO READERS

The address given in brackets at the end of abstract citations is that of the first author at the time of writing and is normally where the work was carried out.

Transliteration of Cyrillic script follows the British system (British Standard 2979 : 1958).

ABBREVIATIONS

Periodicals. The abbreviations used for the titles of periodicals and reports conform where possible to those given in the *World List of Scientific Periodicals* (London : Butterworth) and are listed in *Field Crop Abstracts* Vol. 21, No. 1, pp. xi-xxxv ; they can also be obtained as a separate from the Commonwealth Bureau of Pastures and Field Crops, Hurley, Berks, England, price 5s.

Languages. The language abbreviations used are based on British Standard 3862 : 1965. An initial capital letter denotes the main language of a paper, a small letter the language of the summary(ies).

Af — Afrikaans	Es — Spanish	Pl — Polish
Al — Albanian	F — French	Pt — Portugese
Ar — Arabic	Fi — Finnish	Ro — Romanian
Bg — Bulgarian	Hu — Hungarian	Ru — Russian
Ch — Chinese	I — Italian	Sh — Serbo-Croat
Cs — Czech	J — Japanese	Sk — Slovak
D — German	Nl — Dutch	Sv — Swedish
Da — Danish	No — Norwegian	Tr — Turkish
E — English		Uk — Ukrainian

Units, chemical elements, etc. The abbreviations used for the names of common units, mathematical operations, chemical elements, etc. are in accordance with British Standard 1991 : 1954. The following additional abbreviations are also used :

a.e.	— acid equivalent	F.U.	— food/fodder unit
a.i.	— active ingredient	f.y.m.	— farmyard manure
alt.	— altitude	LAI	— leaf-area index
bibl.	— bibliography	LAR	— leaf-area ratio
CP	— crude protein	lat.	— latitude
cv.	— cultivar(s)	m.eq.	— milli-equivalent
DM	— dry matter	NAR	— net assimilation rate
f.c.	— foot candle	ppm.	— parts per million
F.C.A.	— *Field Crop Abstracts*	RGR	— relative growth rate
F.s.	— From summary	SE	— starch equivalent
		var.	— *varietas*

FIELD CROP ABSTRACTS

Vol. 22, Nos 1, 2, 3, 4, 1969

SUMMARY OF CONTENTS

REVIEW ARTICLES

	Pages
The effects of daylength upon the development and growth of wheat, barley and oats. E. J. M. KIRBY	1
Safflower. D. F. BEECH	107
Oil-seed crops in Britain. E. S. BUNTING	215
Jute. M. S. SARMA	323

ABSTRACT SECTION

	Pages
ANNUAL FIELD CROPS	
CEREALS	
Wheat	9 121 225 337
Oats	20 130 236 354
Rye	22 132 238 356
Barley	23 133 239 357
Maize	29 136 244 362
Sweet-corn	35 143 253 371
Sorghum	35 143 253 371
Millets	37 144 254 373
Rice	37 145 255 373
Teff	46
General	47 151 262 383
LEGUMES	
Cowpeas	48 264
Soyabeans	49 153 265 386
Groundnuts	50 155 267 388
Peas	52 156 268 391
Field Beans (*Vicia faba*)	54 159 272 393
Vicia sativa	273
Phaseolus spp.	159 273 394
Vigna spp.	395
Lupins	160 273 395
Chickpeas	160 273 396
Guar	273
Lentils	161 396
Lathyrus sativus	273
Lablab niger	396
General	161 273 396
ROOT CROPS	
Sugar-beet	56 163 274 397
Fodder-beet	167 278 401
Turnips	62 278 401
Potatoes	62 167 278 402
Sweet-potatoes	70 173 283 410
Cassava	71 283 410
Yams	72 174 283
Cocoyams	72 410
Amorphophallus spp.	72
Arracacia xanthorhiza	72
General	72 174 283
FIBRE CROPS	
Cotton	72 174 283 410
Fibre flax	79 179 289 421
Hemp	79 180 290 422
Jute	79 180 290 423
Kenaf	80 180 290 424
Hibiscus	181
Crotalaria juncea	424
Malachra capitata	424
OIL CROPS	
Castor bean	80 181 290 425
Sesame	80 425
Oil-seed flax	81 181 291 425
Safflower	81 182 291 426
Sunflower	81 182 291 426
Rape	83 184 292 427
Mustards	83 184 292 428
Radish	83
Crambe	84 184 293
Poppy	84 293
Oil-seed pumpkin	84 293
Vernonia anthelmintica	185 428
Guizotica abyssinica	428
Dracocephalum moldavicum	429
General	185 293
MISCELLANEOUS CROPS	
Buckwheat	84 185 294 429
Brassicas	294 429
Tobacco	84 185 294 429
Amaranthus spp.	299
GREEN MANURE AND COVER CROPS	87 193 299 435
CROP BOTANY	
Metabolism and nutrition	87 193 300 435
Growth and development	90 196 302 438
Growth substances	90 196 303 439
Environment	91 197 303 440
Radiobiology	91 198 304 442
Techniques and apparatus	91 198 304 442
Morphology and taxonomy	92 199 306
WEEDS and WEED CONTROL	93 199 306 445
SURVEYS and LAND USE	200 307 446
FARMING SYSTEMS and PRACTICES	94 200 307 447
SOIL and WATER CONSERVATION	96 201 449
AGROMETEOROLOGY and CLIMATOLOGY	96 201 309 450
MISCELLANEOUS	96 202 310 451
REPORTS	98 202 311 452
MEETINGS	98 206 314 455
BOOKS	100 207 318 457
NEWS and NOTES	104 211 319 462
ANNUAL SUBJECT INDEX	467
ANNUAL AUTHOR INDEX	509

ANNOTATED BIBLIOGRAPHIES FOR SALE

The price per copy includes the cost of postage by surface mail.

Number	Subject	No. of refs	Period covered	Price
584	*Hisbiscus cannabinus* (kenaf)—growing conditions, varieties and general information	71	1952–67	14s.
999	Effects of N, P and soil moisture on the vegetative growth of wheat, oats, barley and rye	104	1958–67	20s.
1005	Anatomy and morphology of barley	42	1947–65	8s.
1008	Water relations of the rice plant	70	1960–65	14s.
1010	Pigeon peas (*Cajanus cajan*)	47	1959–65	8s.
1012	Cigar tobacco	39	1936–64	6s.
1015	Effect of temperature on growth, flower-production, fruit set and fruit development in the groundnut	16	1951–66	4s.
1016	Potatoes, effects of size of tuber and cut v. entire tubers on yield and growth	31	1958–66	6s.
1018	Production and processing of cassava	20	1951–66	4s.
1020	Annual cropping and shifting cultivation in the humid tropics (selected references)	52	1958–66	10s.
1022	Border effects in plot experiments	39	1922–66	6s.
1024	Temperate oil-seed rape crops	199	1960–66	38s.
1025	Oil synthesis in crops : environmental effects	74	1958–66	14s.
1037	Techniques for the study of roots	52	1960–67	10s.
1042	Potatoes: tuber size and grading	31	1959–68	6s.
1046	Seed dormancy in groundnuts	19	1937–68	4s.
1047	Effect of water stress on the growth and development of groundnuts	21	1957–67	4s.
1049	*Xanthosoma* spp.	13	1956–67	4s.
1050	Cocoyams (*Colocasia* spp.)	39	1956–67	6s.
1063	Water stress in wheat	55	1962–66	10s.
1071	Sprinkler irrigation of rice	8	1951–67	4s.
1075	Factors affecting the oil and protein content of groundnut seed	29	1930–67	4s.
1079	Bambarra Groundnuts (*Voandzeia subterranea*)	13	1959–67	4s.
1089	Seed rate of wheat, oats and barley and its effect on yield	76	1964–67	14s.
1098	Composition of barley grain and straw in relation to quality and yield	134	1957–68	26s.
1099	Composition of oats grain and straw in relation to grain quality and yield	89	1957–68	16s.
1102	Zinc deficiency in annual field crops and pastures	29	1966–68	4s.
1105	Ratooning of cotton	12	1948–67	4s.
1111	Foliar analysis in cotton	27	1958–68	4s.
1115(1)	Lodging in cereals —Wheat	64	1959–68	12s.
1115(2)	—Barley	34	1959–68	6s.
1115(3)	—Oats	23	1959–68	4s.
1115(4)	—Maize	20	1959–68	4s.
1115(5)	—Rice	36	1959–68	6s.
1115(6)	—Miscellaneous (including rye and sorghum)	13	1959–68	4s.
1124	Leaf area measurement	48	1959–68	8s.
1128	Cereal yield estimation	78	1948–68	14s.
1134	Aerial photography : crops and vegetation	29	1947–68	4s.
1136	Kale	122	1964–68	24s.
1137	Field beans (*Vicia faba*)	94	1956–68	18s.

ANNOTATED BIBLIOGRAPHIES FOR SALE

(CONTINUED)

Number	Subject	No. of refs	Period covered	Price
1138	Fodder-beet	133	1958–68	26s.
1140	The effect of temperature on the germination of oats	10	1948–68	4s.
1144	Research on soyabeans in Europe and the USSR	78	1960–68	14s.
1151	Wheat grain quality	160	1964–68	32s.
1159	Depth of sowing of wheat, barley, oats and rye	37	1949–68	6s.
1163	The date of sowing wheat in Autumn in N. Europe	25	1950–68	4s.
1166	Foliar contamination by radioactive substances	79	1953–68	14s.

REVIEW ARTICLE REPRINTS FOR SALE

5s. 0d. ($0.70) per copy, post free

Jute. M. S. Sarma (1969)
Oil-seed crops in Britain. E. S. Bunting (1969)
Safflower. D. F. Beech (1969)
The effects of daylength upon the development and growth of wheat, barley and oats. E. J. M. Kirby (1969)
Physiological concepts for high soyabean yields. C. R. Weber (1968)
Seed dormancy problems in cereals. B. Belderok (1968).
CCC and cereals. E. C. Humphries (1968)
Maize in Europe. E. S. Bunting (1968)
The effect of weather on the growth of barley. L. P. Smith (1967)
Sesame. A. J. Tribe (1967)
Physiological approaches to yield determination in wheat and barley. R. H. M. Langer (1967)
Rice production and world hunger. J. Vallega (1967)
The effect of shelter on the productivity of grasslands and field crops. Parts 1 and 2. J. K. Marshall (1967)
Tobacco. A review of some recent developments, with particular reference to flue-cured tobacco. B. C. Akehurst (1966)
Cotton and cotton research in Africa. J. M. Munro (1966)
Scientific and technical periodicals on agriculture and agricultural biology published in the USSR. I. V. Larin (1966)
Poppy cultivation. Bengt Lööf (1966)
Hybrid grain sorghum for eastern and southern Africa. H. Doggett (1965)
Sorghum in West Africa. D. L. Curtis (1965)
Light and crop production. J. L. Monteith (1965)
The kale crop in Great Britain. L. A. Willey (1964)
Cowpeas, *Vigna unguiculata* (L.) Walp. J. P. F. Sellschop (1962)
Drought resistance of crop plants. L. H. May and F. L. Milthorpe (1962)
Photosynthesis and the theory of obtaining high crop yields. A. A. Ničiporović. An abstract with commentary by J. A. Black and D. J. Watson (1960)
The possibility of cultivating maize in regions with low temperatures. B. Torssell, E. Åberg and E. Åkerberg (1959)
Recent developments in groundnut production, with special reference to Africa. Parts 1 and 2. P. A. Oram (1958)
Bird-resistance in sorghum and the Quelea problem. H. Doggett (1957)
Nutrient uptake from leaf sprays by crops. Gillian Thorne (1955)
Potatoes : the use of cut setts and the treatment of cut surfaces. P. J. Boyle and W. J. Baulkwill (1955)

Orders for the above should be sent to :

Commonwealth Bureau of Pastures and Field Crops, Hurley, Maidenhead, Berks, England

PHOTOCOPIES

Where readers are unable to obtain reprints of articles abstracted in *Field Crop Abstracts* by writing direct to authors, the Bureau will endeavour to supply photocopies at a cost of 2s. per page of text, post free. Orders should be addressed to the Commonwealth Bureau of Pastures and Field Crops, Hurley, Berks, England, and should be accompanied by a personally signed declaration, as follows :

Please send me a photostat copy of the following article : .....

.....

Field Crop Abstracts reference : Vol..... Abstract No.....

I have not previously been supplied with a copy of the above article. I undertake that if a copy is supplied in accordance with this request, it will be used solely for the purpose of research or private study.

Date..... *Signature*.....